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MECHANICAL TREATMENT OF INTESTINAL DISEASE.*

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HAVING had the honor of addressing this Association a year ago upon the general topic of mechanical therapeutics, it is particularly interesting for me to have the privilege of continuing the subject by contributing a paper to-day upon the mechanical treatment of intestinal disease. It is an opportunity to illustrate more plainly the practical application of this theory.

For the purposes of this paper let us divide the mechanical treatment of intestinal disease into two classes, namely, general and specific. By general let us understand to be meant all of those conventional procedures of a mechanical character which are commonly resorted to by followers of all schools of practice for the purpose of improving in a general way the tonicity and functional activity of the intestines. In the specific class we may place that more limited number of procedures which have an absolutely direct and local effect which can be demonstrated theoretically and clinically. It is with the latter only that this paper has to deal.

Under the former division come the orthodox procedures familiar to the members of this Association. A detailed enumeration is unnecessary, but it might be well to observe in passing that the tendency of the day in all schools seems to be toward the utilization of such methods, together with dietetics, instead of internal medication, for most intestinal disease. The

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contention of this paper, then, is that, if we are going to rely so largely upon mechanical treatment for the correction of the most common intestinal diseases, why should we content ourselves with the superficial or general methods, instead of following the general trend of scientific progress in this, as in all other branches, and becoming more specific in mechanical therapeutics? Instead of dismissing the patient with instructions to walk and take other exercise, and to roll the cannon ball around the abdomen in the path of the colon, and such other general instructions, why not be more scientific and examine each individual case for some possible interference with mechanism, and if this is found, to correct it if possible by adjustment, and thus secure a resumption and permanent maintenance of correct function?

These remarks must not be construed as criticizing in the slightest degree the conventional mechanical treatment of abdominal conditions. All of this sort of procedure is excellent and important, and should not be omitted. The belief of the writer is merely that the mechanical consideration of the abdominal condition should not stop at this point, but proceed in the search for a possible mechanical cause, which may be different in each case. Superficiality may pertain to mechanical therapeutics as well as to drug medication, and the old adage "Treat the patient and not the disease," may as aptly be applied to mechanics as to general medical practice. Another prevalent error in point of view should be corrected early in the consideration of this subject. This is that mechanical treatment of the intestines is applied to the abdominal surface. Such an idea brings you back at once to the differentiation previously considered. The treatment of the abdominal surface is of necessity very largely a general treatment, and while we are attempting to bring ourselves to a consideration of specific treatment, let us have the same understanding, if you please, that we had before. Herein is no criticism of abdominal treatment. It has its place and should not be neglected, but on the other hand it can never usurp the place of truly specific therapeutics.

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Before we consider specific mechanical therapeutics, let us examine for a moment the machine we are going to treat.

Probably it is logical to think of a series of centers for the control of the circulation, secretion and movements of the intestines. These are arranged in somewhat of a segmental manner, and involve the lateral gray matter of the lower thoracic and the upper lumbar part of the cord.

The axons of the lateral horn cells pass in part as white rami communicantes to the ganglia of the lateral chain of the sympathetic, and in part as the white fibers of the splanchnic nerves, especially the upper and middle splanchnics, to the ganglia of the solar, celiac, mesenteric and peripheral plexuses. The gray fibers, axons of the sympathetic cells, carry the visceral afferent impulses to the glands and muscles of the intestines and to the blood-vessels.

The spinal intestinal centers are influenced by impulses from the following sources, according to Burns:

1. Impulses from the digestive tract are carried to these centers by the visceral afferent nerves. The action of the entire digestive tract in its secretion, muscular activities and circulation is thus in part kept unified through direct reflex action.

2. Sensory impulses from somatic structures are carried to these centers by the somatic efferent nerves and perhaps also by the interpolated association neurons. This relationship is illustrated by the atonic condition of the intestinal wall, the lack of intestinal secretions, and the deficient tone of the intestinal blood-vessels so often found associated with those vertebral abnormalities which prevent the normal stream of nerve impulses from the joint surfaces and the sequence of relaxation and contraction of the deeper spinal muscles. If the spinal column be abnormally stiff, if the mobility be decreased, and these activities of the centers which depend upon the stimulation afforded by the sensory impulses must necessarily be lessened, unless compensatory activities be initiated in other parts of the nervous system.

3. Descending impulses from the medulla, from the

higher spinal centers, and ascending impulses from the lower spinal centers in functional relationship, affect the action of the centers controlling intestinal action.

4. Descending impulses from the medulla, from the related ganglia bring the action of the intestines under the control of the emotional states to a certain extent.

5. The character of the reactions affecting the activity of these centers seems to be somewhat affected by the character of the blood flowing through the center in question. The character of the visceral afferent impulses seems also to be affected by the quality of the blood circulating through the viscera and around the nerve endings. This consideration seems to be especially concerned with the carbon dioxide content of the blood. Certain irritants and poisons also may affect the action of these centers.

I think we can all see now why we do not care to spend too much time considering general mechanical measures when we have such important technical details of machinery to consider both from the standpoint of diagnosis and therapeutics. In other words, we do not desire, if we are thorough and scientific physicians, merely to make a patient's bowels act somewhat better for a brief time afterwards, but we want to know why they do not functionate, and to discover what to do in the way of structural adjustment, so that they will run like a perfect machine as long as they remain in correct adjustment.

The axiom of general practice that a correct diagnosis is more than half of the cure, applies equally well to mechanical therapeutics, —but and this is a very large "but"—the contention of this paper is that a correct diagnosis does not mean merely a correct statement of the local pathology of the intestinal tube itself. A correct diagnosis, as the words are herein to be understood, means a consideration of the pathological condition of those structures which can mechanically interfere with the normal function of the organ.

It seems to the writer that this is both logical and scientific. Following out this idea, a correct diagnosis of an intestinal disease in an individual case includes

a statement of mechanical interferences by individual vertebræ or ribs, or by spinal segments or curvatures, or other postural or mechanical irregularities.

Posture is a potent factor in the etiology of intestinal disease. I have found a number of cases where the symptoms pointed very definitely to appendicular disease, and others where the indications were those of renal calculus, yet all symptoms disappeared permanently upon the correction of the spinal posture. What is the reason for this result? The most common fault of posture is the pendulant abdomen. This results directly and invariably in a more or less marked lumbar lordosis and a compensatory exaggerated posterior position of the upper dorsal segment.

Now, the point I wish to make is that the effect of this posture upon the abdomen is not a general one alone. It can and often does produce definite and marked sensory symptoms, perfectly simulating at times those of appendicitis and renal colic. The anatomical reason is perfectly plain if one takes the trouble to figure it out. The ileo-hypogastric and the ileo-inguinal nerves arise from the first lumbar division of the cord and pass through the psoas muscle. Crossing the quadratus muscle in the retro-peritoneal space, they run between the transversalis and the internal oblique. The ileo-hypogastric becomes cutaneous above the anterior superior spine, not far from McBurney's point, while the ileo-inguinal passes through the inguinal canal, so that referred pain along the course of these nerves might very easily simulate appendix or kidney pains. The method of diagnosing such a factor as this in the case of intestinal disease is very simple, and yet does not enter into the procedure of the ordinary routine examination of the general practitioner. Take your plumb-line, which is one of my most important instruments of diagnosis, and ascertain the center of gravity in the case of your patient. With your plumb-line against the lateral aspect of the clinic in the standing position, you would find in the normal that the line would cross the olecranon process and the anterior superior spine. If

the whole upper part of the body lies in a plane posterior to the center of gravity, then, in order to maintain balance, it becomes necessary for the patient to throw forward the lumbar region. This brings a great strain upon the psoas muscle and upon whatever nerves pass through it. Dr. Rogers, of the orthopedic department of the Massachusetts General Hospital, reports a number of cures of apparent appendix conditions by correction of faulty attitudes of this character by means of abdominal supports and back braces. I believe, however, that they can be better cured without too much dependence upon artificial support. Support always causes some weakness, so if you can train the patient to support himself and help him by readjusting the spine and prescribing exercises to increase muscle tissue to hold him up, it strikes me you are making a more permanent and better sort of a cure.

I have found that one of the most common causes of intestinal disease is decreased function of the diaphragm. The diaphragm is not only a muscle of respiration; it is also the most important muscle; or, I might say, the most important organ, for the maintenance of abdominal rhythm, and consequently abdominal circulation, function and tonicity. In those patients of sedentary habits and that means most of your chronic city cases, there is decreased diaphragm function, due to decreased respiration as a result of insufficient exercise. There is an artificial way to compensate here. If the city patient does not have enough exercise to create sufficient diaphragm movement, and you cannot make him take the exercise, he can improve matters very much indeed by developing the diaphragm itself by specific exercise. It is easily taught by asking the patient to hold his breath and draw his abdomen in and out forcibly. This exercise is to be done several times daily, but for a brief time only. It should be begun very gradually indeed, otherwise there will be lameness, and lameness of this muscle is not to be ignored. Properly done and continued for a period of time, I have found this exercise to make a vast difference in the abdominal health and

strength, and consequently to effect the general health and nutrition to a marked degree.

The Drs. Cyriax, of London, in the *New York Medical Journal,* report that:

"The indirect method, *i.e.,* through the medium of the posterior spinal nerves, is largely employed by us with great benefit in the majority of affections of the abdominal organs, even in acute inflammatory conditions, where, of course, we modify the strength of the manipulation, length of application, etc., to suit each individual case. We have also employed it during parturition, and are quite satisfied with the result.

"The direct method is most useful in irritated and chronic diarrhea, endometritis, etc. In these cases light friction on the abdominal ganglia should be employed. In atonic and paralytic conditions of the organs, *i.e.,* severe constipation, dilatation of viscera, strong friction would be indicated. In vasomotor disturbances such as Raynaud's disease, shock, anemia of the head, we have the indications for strong friction.

"Personally we do not use the direct sympathetic (nor, for the matter of that, the indirect method), as a treatment *per se,* but always in conjunction with other manipulations and active exercises where the latter can be performed. In obstinate and intractable abdominal conditions we have found that the direct method is one of the strongest and most effective measures at our command. It will frequently succeed when everything failed."

Dr. Abrams, of the French Hospital, San Francisco, finds that the intra-abdominal venous congestion in splanchnic neurasthenia is influenced in a variety of ways: 1. By abdominal massage and abdominal exercises. 2. By strengthening the abdominal muscles. 3. By abdominal supporters. 4. By eliciting the liver reflex of contraction. 5. By toning the splanchnic vaso-motor mechanism. Respecting the latter method: The dorsal region of the spinal cord represents the origin of the majority of vaso-constrictors in the body. The splanchnic vaso-motor mechanism which controls the vessels of the abdominal viscera consists of the splanchnic nerves, which are composed of fibers issu-

ing from the cord in the fifth to the twelfth dorsal nerves, inclusive. The dorsal nerves in question correspond to the spines of the second to the eighth dorsal vertebræ, inclusive. Now, if the spines in question are concussed, the cardio-splanchnic phenomenon is at once brought into evidence. In other words, the blood is expressed from the abdominal vessels to the right heart. Concussion, then, of the second to the eighth dorsal spines, inclusive, is a very active means of augmenting the tone of the splanchnic vaso-motor mechanism, and constitutes a very efficient method of treatment in splanchnic neurasthenia and in all forms of intra-abdominal congestion, even without nervous symptoms. In Glenard's disease, or enteroptosis, the prolapse of one or more abdominal organs is associated with neurasthenic symptoms, and the wearing of an abdominal supporter affords much relief to the wearer. The relief thus attained is not due wholly to reposition of the organs, as is instanced in the observations of Bial. The latter applied transparent bandages to cases of gastroptoses, and transilluminated the stomachs before and after the application of the bandages. No change in the position of the stomach could be noted, and it is therefore most likely that abdominal supporters act chiefly by compression of the viscera, which, in turn, squeeze the blood out of the turgid abdominal veins, Abrams concludes.

Again, Abrams, writing recently, says:

"If one electrode of a sinusoidal current is placed over the sacrum and the other over the spines of the first three lumbar vertebræ; or, if the spines in question are concussed, one evokes the liver reflex of contraction. Either maneuver will promote the excretion of indican in the urine, and its presence in the urine may be demonstrated after a single seance lasting fifteen minutes, even though previously absent. Naturally the urine must be voided before and after the application of the current, and the specimens compared after examination is made for indican. Like the generality of veins, the great splanchnic veins are very susceptible to pressure, and the amount of blood within them is greatly influenced by the pressure of the abdominal walls. Mere pressure of the latter suf-

fices to squeeze out of them a large quantity of blood. More blood accumulates in the splanchnic veins in the erect than in the recumbent posture, and it is not an uncommon observation for syncope to occur in bed-ridden patients who are suddenly constrained to get out of bed. The removal of stays in women often induces a feeling of faintness, and the same symptom may occur when a large quantity of ascetic fluid is removed, and, in susceptible subjects, when the bladder is emptied or feces discharged. Hill has shown that in consequence of some failure, the blood gravitates into the splanchnic veins from the right heart, and that pressure upon the abdomen will send back the blood from the heart, and thus re-establish the circulation. If the lower sternal region, *i.e.*, the part of the sternum contiguous to the heart, is first percussed, the sound elicited is one of resonance or hyperresonance; if now, one makes vigorous compression of the abdomen, percussion again shows that the region in question has become dull or even flat. This is the cardio-splanchnic phenomenon, and is present even in the norm, but where there is intra-abdominal venous congestion, as in splanchnic neurasthenia, this phenomenon is much exaggerated, and the area of dullness is more diffused. By percussing the lower end of the sternum in the erect posture, one obtains a resonance, but when the patient assumes the recumbent posture a dullness supplants the resonance. This is the attitudinal cardio-splanchnic phenomenon. It is present in health, but absent when the splanchnic vaso-motor mechanism is defective. The splanchnic circulation is partly venous and partly arterial, and consists of the portal vein and its branches and the arterial branches of the celiac axis. When a person stands the splanchnic vaso-motor mechanism causes a constriction of the splanchnic vessels, and the blood-pressure rises, but, if ineffective, it fails to rise or falls. Now, in splanchnic neurasthenia, the splanchnic vaso-motor mechanism is exhausted, and it is inadequate to prevent a flow of blood to the splanchnic vessels."

The conclusions one might draw from such a consideration as this are that there are other points of view in the subject of intestinal disease and its treatment than the conventional ones, and to the tra-

ditional procedure might well be added a careful anatomical examination, not only of the abdominal surface, but of whatever other parts have to do with the support, innervation and nutrition of the diseased organ. If this examination discloses any structural irregularity, the question of its adjustment immediately presents itself. Then comes the consideration of the pathology of the structural defect, its duration, mobility, tenderness, etc.; in a word, the problem of whether or not it is correctable, and whether or not there is any contraindication to the administration of proper corrective manipulation. For I should not have you get the idea from me that every case can be subjected to indiscriminate manipulation. Sane and scientific procedure is as necessary here as in the employment of internal medication or in the use of the knife.

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